

Operator Uses Innovative Tool String for DST in Deep Wildcat Exploration Well

WIRELESS DYNALINK® X AND ARMADA® SAMPLING SYSTEM PROVIDE UNINTERRUPTED BOTTOMHOLE DATA TRANSMISSION AND SUCCESSFUL SAMPLE TRANSFER TO SURFACE IN HPHT CONDITIONS

INDONESIA

CHALLENGE

- » Wildcat and deep exploration well in swampy, high-temperature conditions
- » Significant noise interference from simultaneous well interventions
- » High pressure (15K psi) required to kill well
- » Need for stable data communication and transmission

SOLUTION

- » Provide reliable and stable downhole wireless communication with DynaLink® X telemetry system
- » Increased internal sampler pressure to 15K psi with modified Armada® sampling system

RESULT

- » Obtained DST downhole data for monitoring at surface in real-time, without any noise interference
- » Captured all PVT samples — 9 of 9 despite surge pressure up to 16K psi during well kill operation
- » Successfully transferred well samples to surface for further analysis and well evaluation/development
- » Performed well-kill operation safely and effectively
- » Saved 36 hours of rig time and approximately \$150,000 USD in costs

OVERVIEW

An operator wanted to perform a drill stem test (DST) using wireless surface read out (SRO) and downhole sampling of a deep, wildcat exploration well, with limited reference from adjacent wells. This initial high-pressure, high-temperature (HPHT) exploration well attempted in the area was particularly challenging because it required drilling with a swamp rig. The DST campaign was critical to the customer and the country of Indonesia to achieve their target of 1MMBO/day production by the year 2030.

Fast decisions were required during the DST operation, and the operator required reliable, real-time downhole data, and representative samples from the well. This information was also required for proper and comprehensive reservoir analysis, well evaluation, and development.

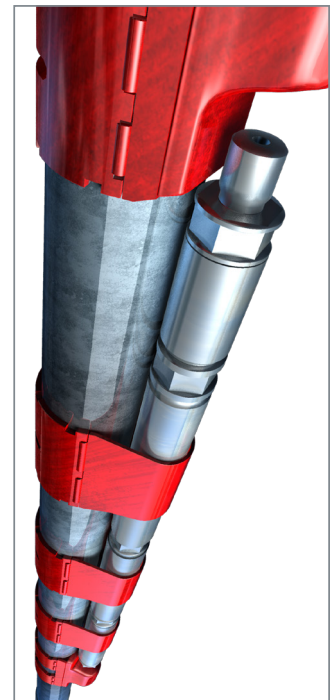
CHALLENGE

The customer wanted to use wireless SRO technology with no interruptions while testing. Another issue of concern was to successfully obtain a total of nine downhole pressure, volume, and temperature (PVT) samples given the high well kill pressure, which was estimated up to 15K psi and could affect the capture of samples in the samplers.

SOLUTION

The Halliburton Testing and Subsea team recommended the DynaLink® X telemetry system in conjunction with the Armada® sampling system, consisting of a proven DST tool string—CHAMP® packer, tubing string testing valve, Select Tester® valve, OMNI™ circulating valve, and rupture disk circulating valve. This represents the first DST job with the DynaLink X telemetry system in the world and the first Armada sampling system used in Indonesia.

The DynaLink X system, rated over 20,000 psi and 350°F (177°C), is the market-leading downhole acoustic transmission platform for real-time readings of bottomhole pressure (BHP)/bottomhole temperature (BHT) delivered to surface throughout the DST operation.



The DynaLink® X telemetry system is the market-leading downhole acoustic transmission platform for real-time readings of BHP/BHT.

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This technology allows operators to monitor and analyze BHP/BHT in real time for quick decision-making while receiving continuous assurance of downhole tool status. The modular concept enables efficient preparation and testing of tools offline, with minimal risk, compared to competitor solutions that can only be tested online (on the rig floor before running in hole).

The Armada sampling system captures more bottomhole samples than traditional, slickline-conveyed sampling. It also minimizes risk because it does not require well intervention, and it does not add any additional time to the DST operation. In this case, the annulus-pressure-activated system was run with a modified entry piston, which increased the internal sampler pressure from 12K psi to 15K psi. This modification delivered bigger kill well pressure for more flexibility during the kill well operation—without jeopardizing samples that were already captured by the tool.

RESULTS

During the DST operation, reservoir engineers determined the reservoir was tight and ordered an injectivity test for better response. However, even after the injectivity test and analysis of real-time BHP/BHT readings, the reservoir was still tight, leading to a swift decision to stop operation and proceed to kill the well. This helped the customer avoid wasted rig time and saved about \$50,000 USD per day, excluding other services.

The DynaLink X telemetry system provided a strong level of confidence when performing the well kill operation, as the actual bottomhole pressure was known. The Armada sampling system worked perfectly, and it returned all required PVT samples, even with the higher well kill pressure.

The combined solution provided ongoing reservoir insights and downhole tool status, so critical decisions could be made accurately and immediately while performing the DST operation. Overall, the customer saved 36 hours of rig time, compared to previous slickline-conveyed bottomhole sampling runs.

Despite downhole interference from well intervention activity, the DynaLink X telemetry system outperformed the legacy system by maintaining stable communication and data transmission. The Armada sampling system kept the presence and integrity of samples in the sampler with 16K psi of well kill pressure, and it also provided the customer with a sufficient pressure window for well control operations.

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